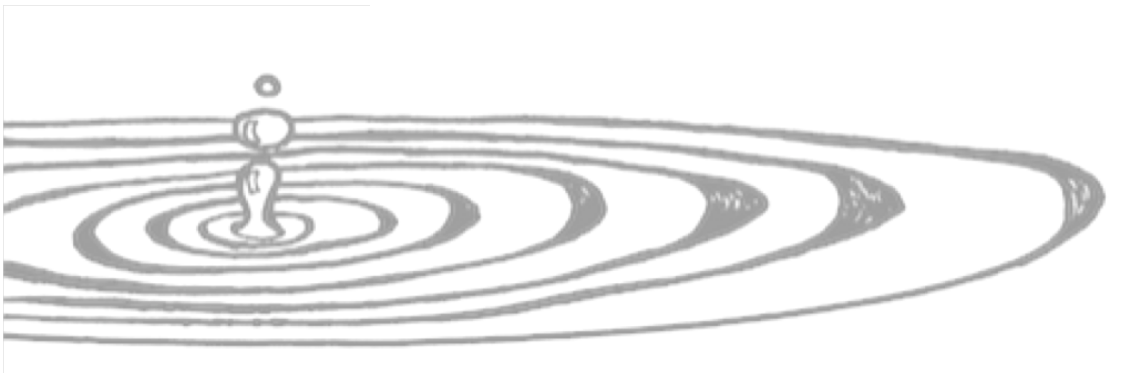




Drinking Water in the Roanoke Valley:



Understanding Residents' Perspectives



A Survey by:



Funded by:



National Science
Foundation

Fall 2019

Note

This document provides descriptive data for a survey conducted September through November of 2019 on a random sample of residents in the Roanoke Valley of Virginia who receive in-home water from a municipal source.

The format below reflects the actual survey question asked followed by a graphical and statistical summary of the responses.

Details about sampling and data collection are available at:

<http://hdl.handle.net/10919/99860>

We're interested in your perceptions of your tap water in the Roanoke Valley. This is part of a project that will help us understand how people think about their drinking water and suggest how water quality can be improved.

TAP WATER is the plain water that comes directly out of your sink's faucet. You may alter your tap water before you drink it by using a filter. That's okay. However, when we ask about tap water, we are referring to your water before it is filtered.

Tap water in your HOME

This survey asks about the water you drink when you are at home—where you reside. If you live in more than one location, please answer based on the address where you received this survey. Please do not consider drinking water conditions at work or at other people's homes.

If you have any questions or concerns, please contact project director Madeline Grupper at maddyag@vt.edu or (540) 231-8303, or Mike Sorice at the same phone number or msorice@vt.edu.

Thank you for your help!

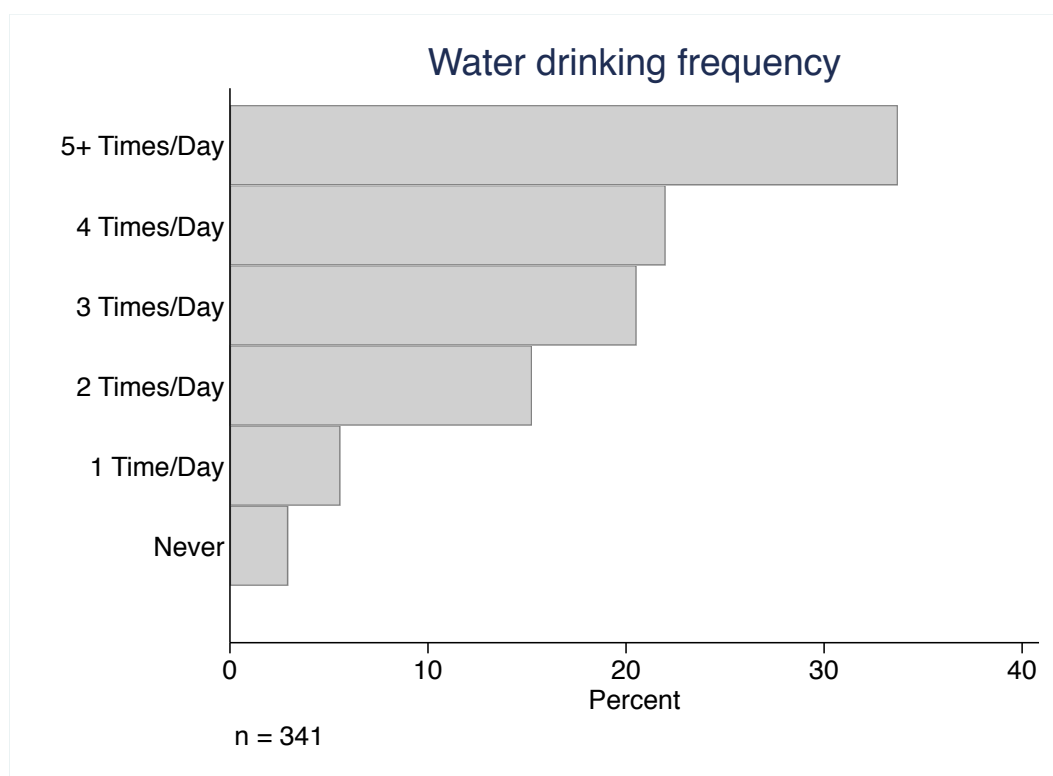
Begin Survey →

SECTION A: WE INVITE YOU TO TELL US ABOUT THE WATER YOU DRINK.

1. In a typical day, how many times do you drink a glass or bottle of water (8 to 12 ounces)?


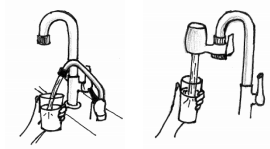
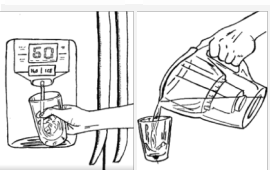
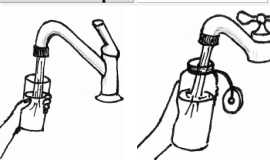
In your estimate include plain tap water, filtered tap water, water from a drinking fountain, water from a water cooler, bottled water, and spring water.

- Never (0 times)
- 1 time per day
- 2 times per day
- 3 times per day
- 4 times per day
- 5 or more times per day



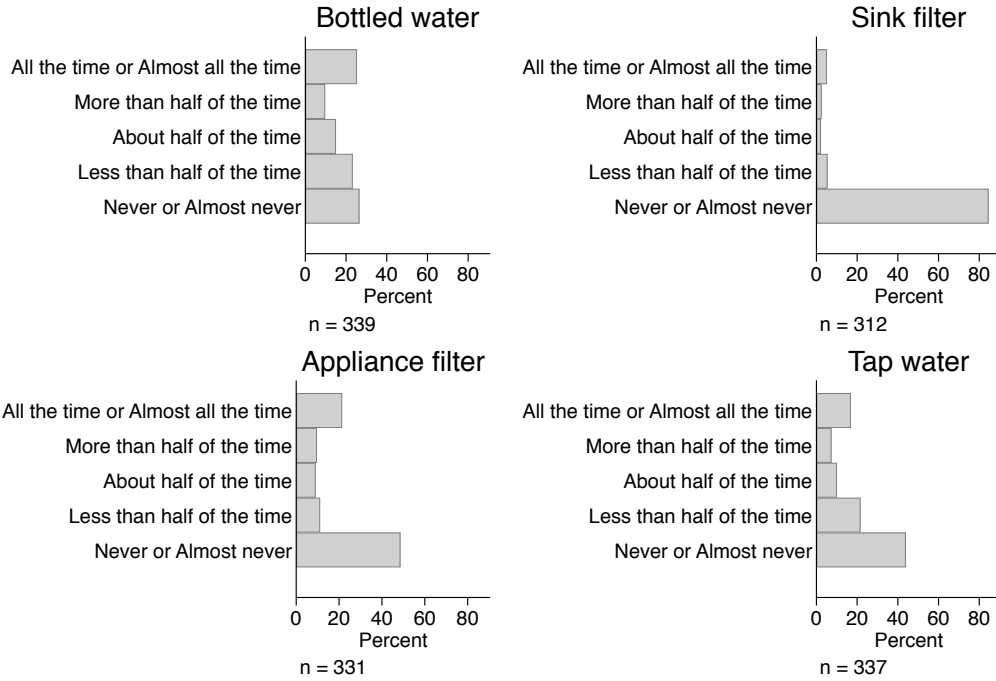
Variable	Mean	St. Dev.	Median	Minimum	Maximum
Water drinking frequency	4.5	1.4	5	1	6

2. Over the past six months, about how often did you drink water from the following sources in your home?

Water source:		Never or Almost never	Less than half of the time	About half of the time	More than half of the time	All the time or Almost all the time
	Bottled water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Filtered water from a sink attachment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Filtered water from an appliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Tap water (straight from your faucet)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

See next page

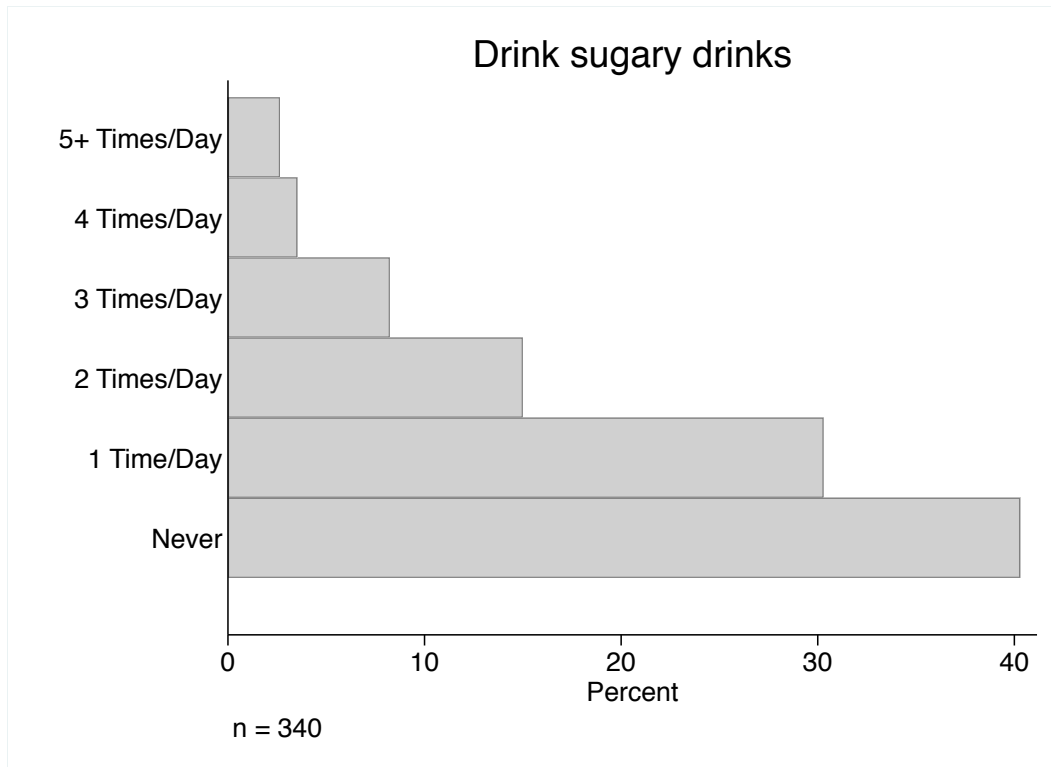
Drinking water sources in home



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Bottled water	2.8	1.5	3	1	5
Sink filter	1.4	1.0	1	1	5
Appliance filter	2.4	1.6	2	1	5
Tap water	2.3	1.5	2	1	5

3. In a typical day, how many times do you drink sweetened drinks like sodas, fruit drinks, sports or energy drinks, or other sugar-sweetened drinks?

- Never (0 times)
- 1 time per day
- 2 times per day
- 3 times per day
- 4 times per day
- 5 or more times per day



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Drink sugary drinks	2.1	1.3	2	1	6

SECTION B: PLEASE TELL US ABOUT THE QUALITY OF TAP WATER IN YOUR HOME.

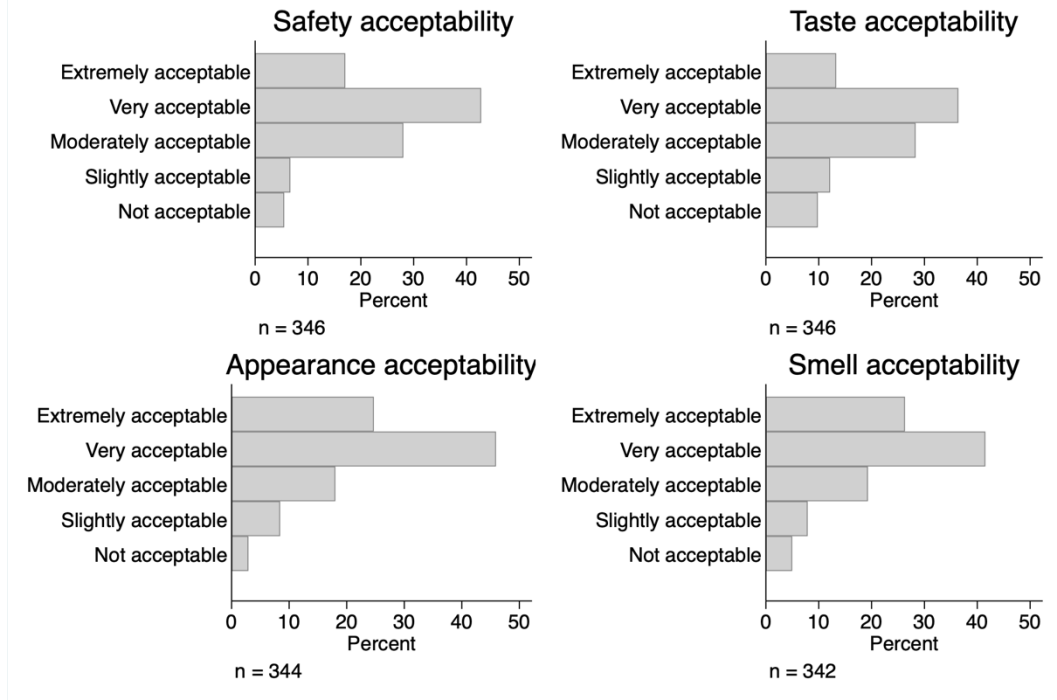
The questions below ask for your opinions of the water that comes directly out of your faucet (tap water). If you filter your tap water before drinking it, please provide your opinion on the water before it is filtered.

4. How acceptable do you typically feel your home's tap water is for drinking in terms of the following characteristics?

	Not acceptable	Slightly acceptable	Moderately acceptable	Very acceptable	Extremely acceptable
Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appearance (color or clarity).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

See next page

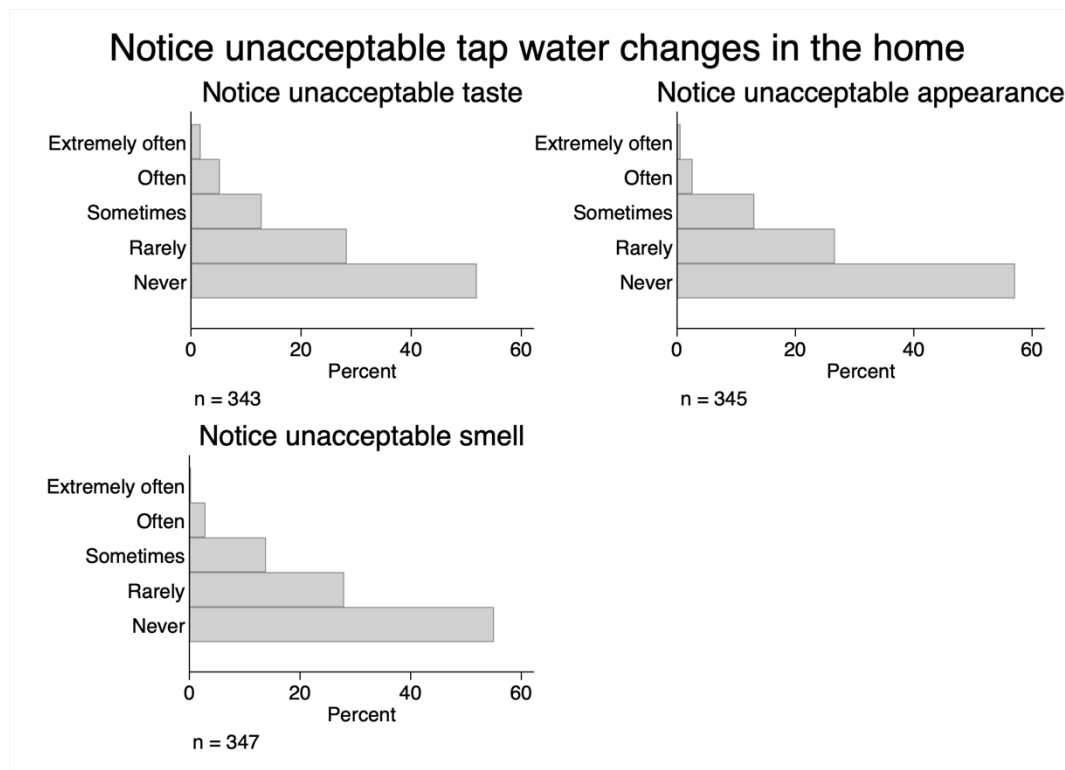
Acceptability of home tap water attributes



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Safety acceptability	3.6	1.0	4	1	5
Taste acceptability	3.3	1.1	3	1	5
Appearance acceptability	3.8	1.0	4	1	5
Smell acceptability	3.8	1.1	4	1	5

5. Characteristics of tap water quality can vary over time. Some people find that variation acceptable while others do not. In the past six months, how often did you notice unacceptable changes in the smell, appearance, or taste of tap water in your home?

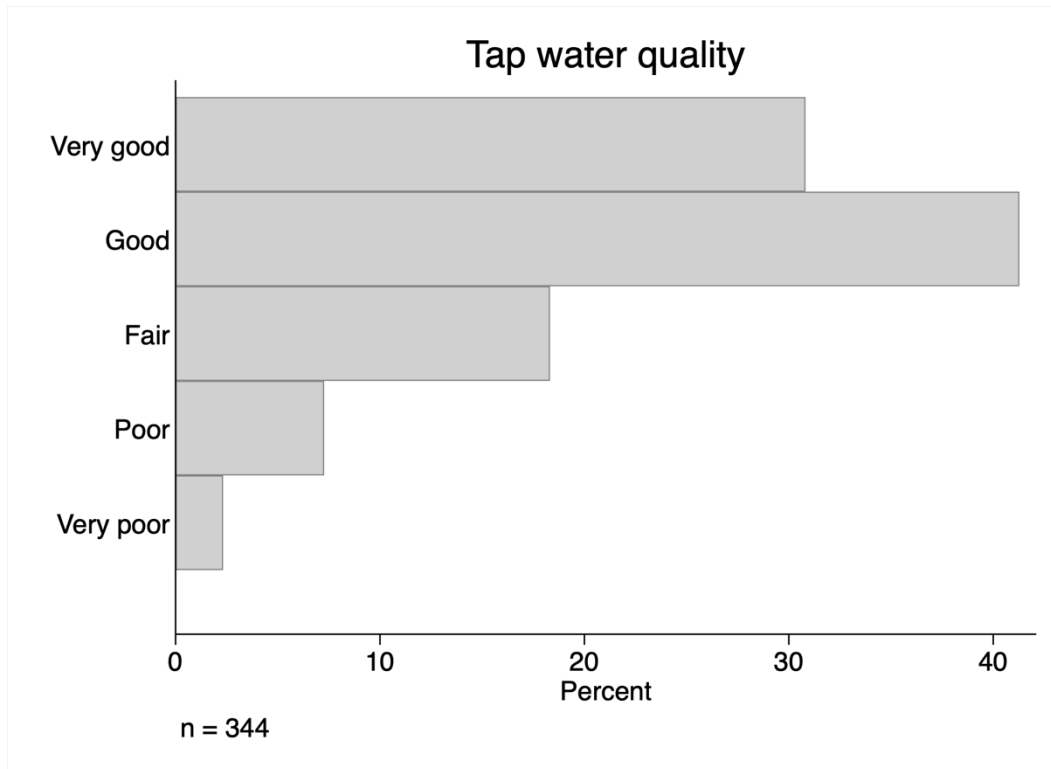
I noticed <i>unacceptable</i> changes in my tap water's:	Never	Rarely	Sometimes	Often	Extremely often
Smell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Notice unacceptable smell	1.7	0.8	1	1	5
Notice unacceptable appearance	1.6	0.8	1	1	5
Notice unacceptable taste	1.8	1.0	1	1	5

6. Overall, how would you evaluate the quality of the tap water in your home?
 Would you say it is:

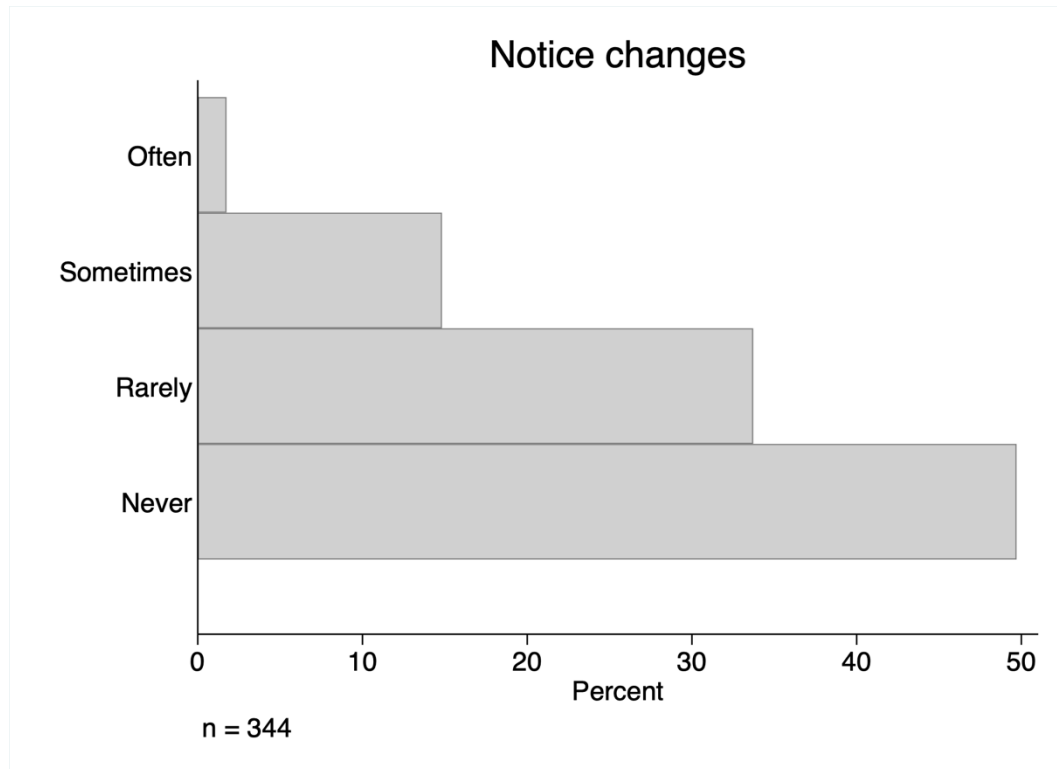
- Very poor
- Poor
- Fair
- Good
- Very good



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Tap water quality	3.9	1.0	4	1	5

7. How frequently do you notice changes in the quality of water coming from your tap?

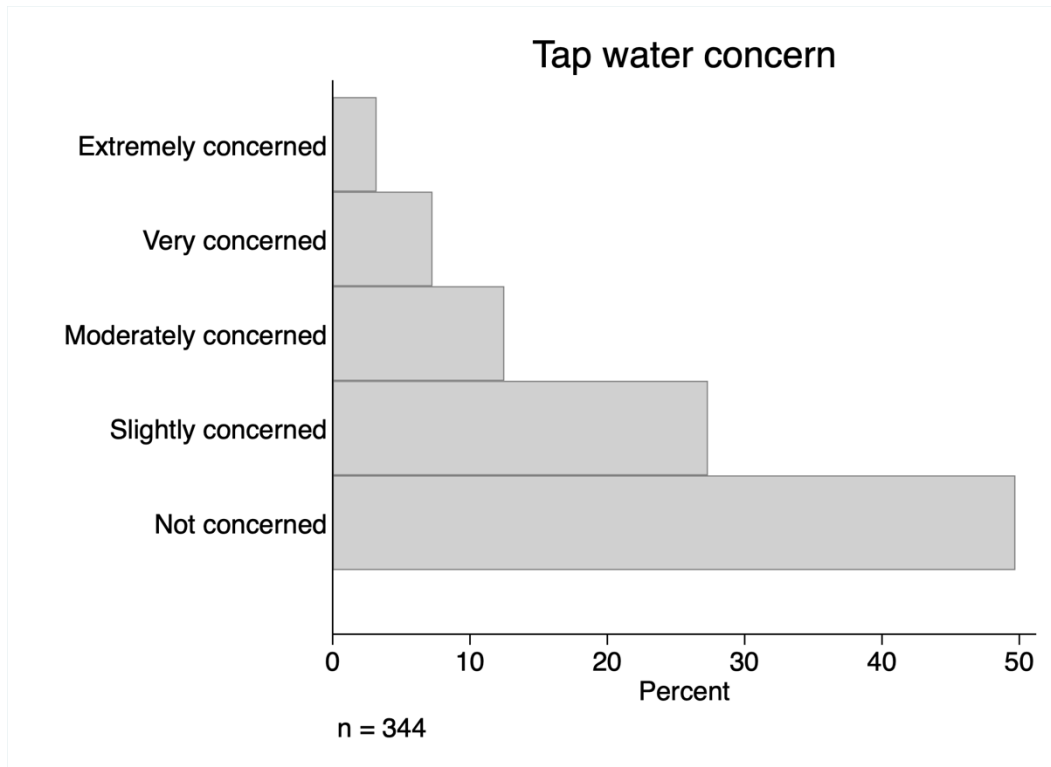
- I never, or almost never, notice changes in quality
- I rarely notice changes in quality
- I sometimes notice changes in quality
- I often notice changes in quality



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Notice changes	1.7	0.8	2	1	4

8. How concerned do you feel about the current quality of your tap water?

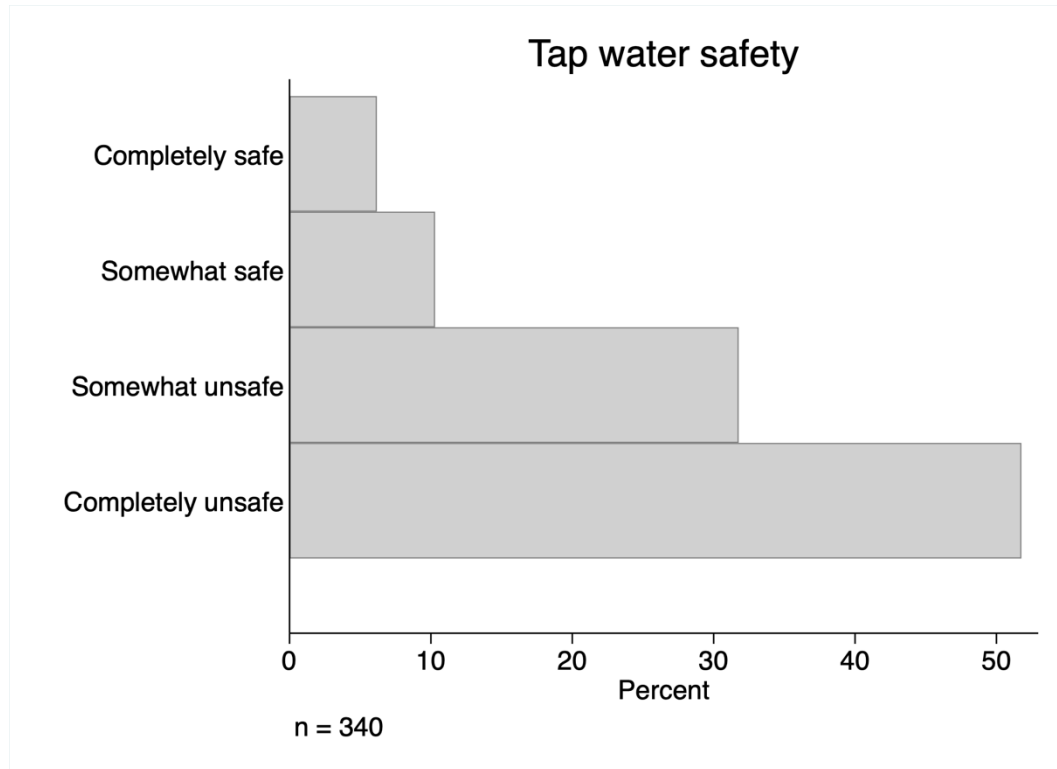
- Not concerned
- Slightly concerned
- Moderately concerned
- Very concerned
- Extremely concerned



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Tap water concern	1.9	1.1	2	1	5

9. Drinking my home's tap water directly from the faucet...

- is completely unsafe for me
- is somewhat unsafe for me
- is somewhat safe for me
- is completely safe for me



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Tap water safety	1.7	0.9	1	1	4

10. Drinking bottled water is _____ safe than drinking the tap water in my home.

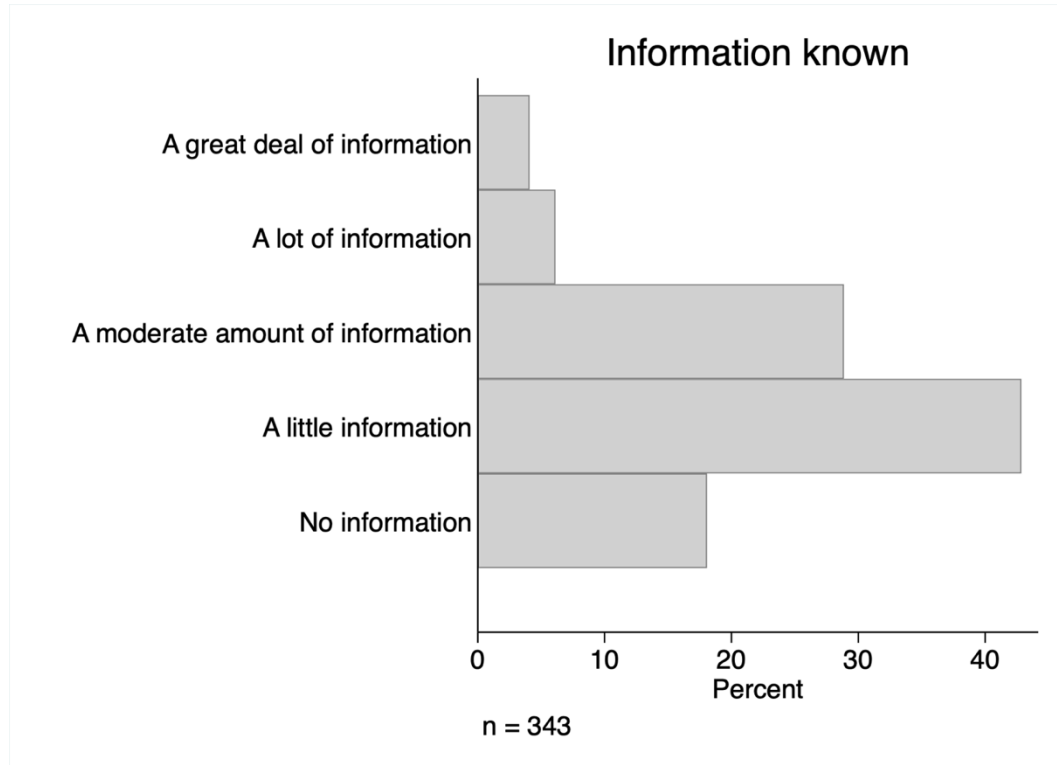
- much less
- somewhat less
- neither more nor less
- somewhat more
- much more



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Bottled vs tap safety	3.5	1.0	3	1	4

11. If a friend or family member asked you about the water quality in your neighborhood, about how much information do you think you'd be able to give them?

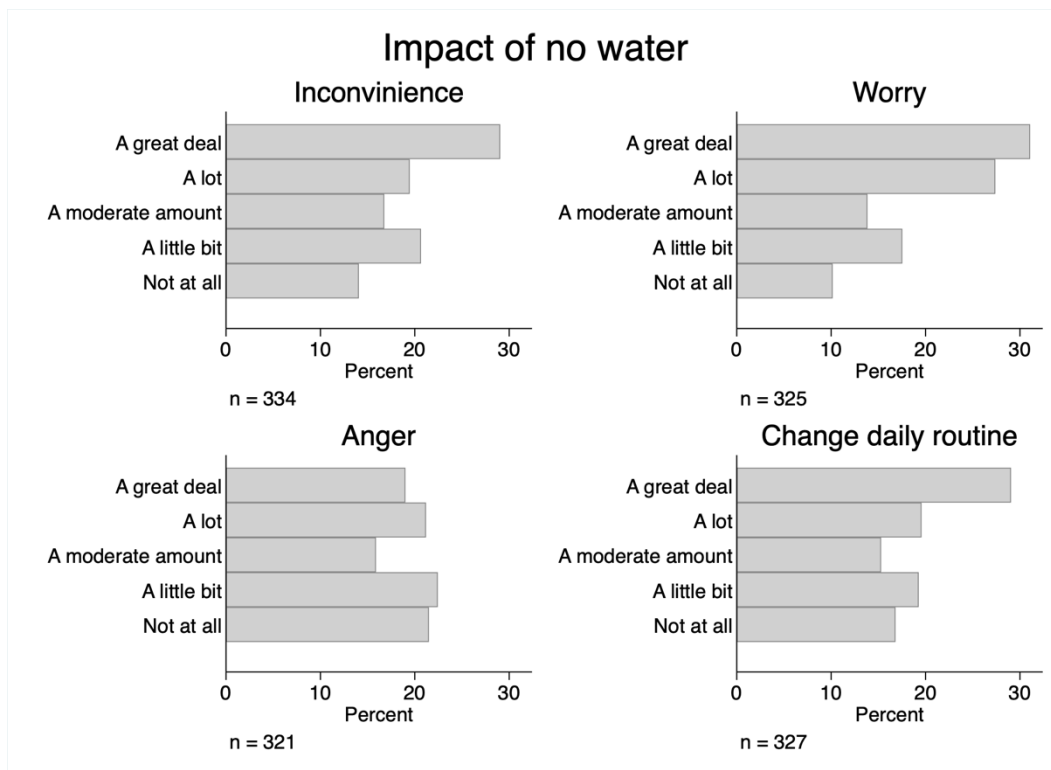
- No information
- A little information
- A moderate amount of information
- A lot of information
- A great deal of information



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Information known	2.4	1.0	2	1	4

12. If tomorrow, for some reason, you were unable to use the water from your tap for drinking, how would that impact you?

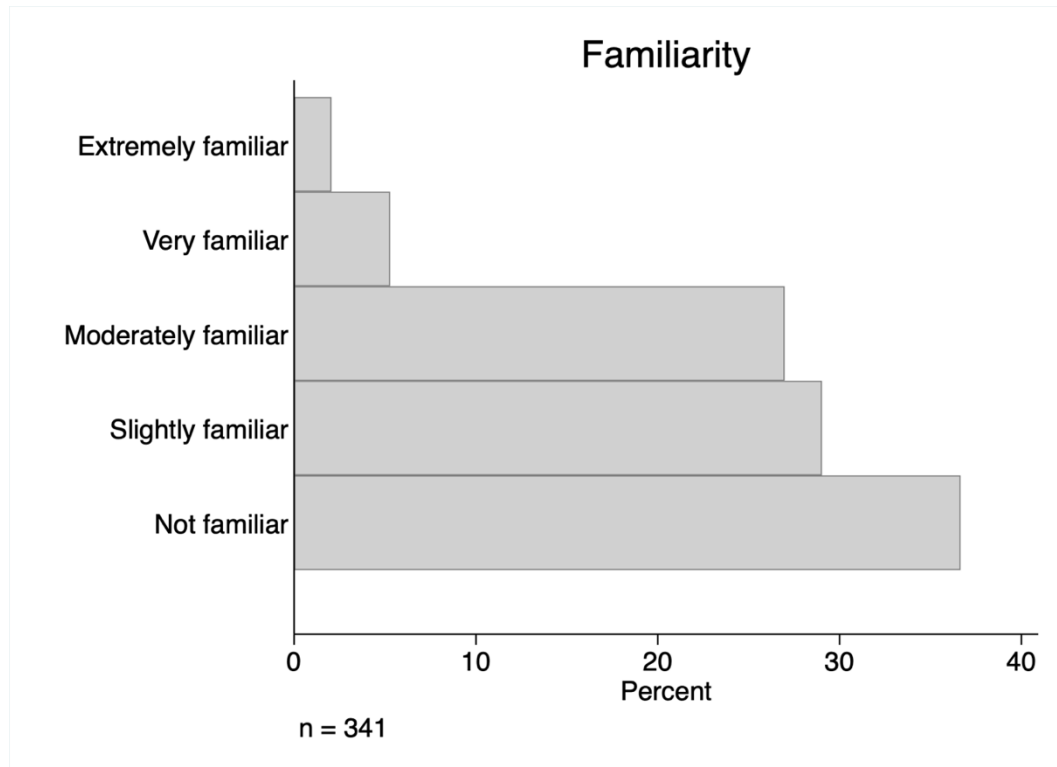
If tomorrow I could not drink water from my tap, it would:	Not at all	A little bit	A moderate amount	A lot	A great deal
inconvenience me.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
worry me.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
anger me.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
change my daily routine.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Inconvenience	3.3	1.4	3	1	5
Worry	3.5	1.4	4	1	5
Anger	2.9	1.4	3	1	5
Change daily routine	3.2	1.5	3	1	5

13. How familiar are you with what your local water utility does to provide tap water to your home? By water utility we mean the organization in charge of treating and delivering water to your home.

- Not familiar
- Slightly familiar
- Moderately familiar
- Very familiar
- Extremely familiar



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Familiarity	2.1	1.0	2	1	4

SECTION C: PLEASE TELL US YOUR THOUGHTS ON YOUR LOCAL WATER UTILITY.

One of three different conditions introduced this next section as part of this survey's experimental design. One condition, the control, did not provide respondents with additional information about their water utility. Respondents in this condition were simply asked to respond to questions about trust in their water utility.

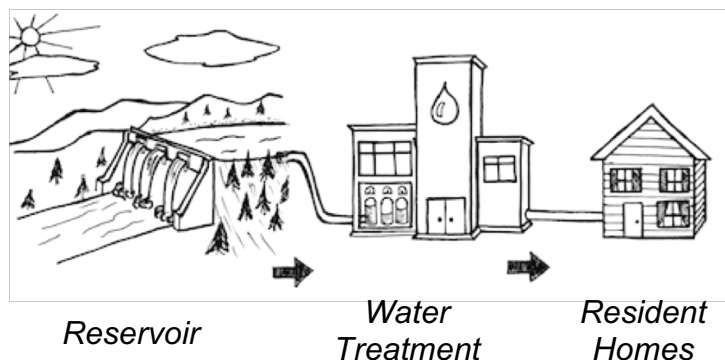
The remaining two conditions provided respondents with information about their utility, either broadly (*general information* condition), or specific to novel water forecasting technology (*technology information* condition) before asking about trust in their water utility. The first two paragraphs of both information conditions were identical and the last two were different. The two treatments (*general* and *technology-specific*):

Text used to introduce treatments in both the *general information* and *technology information* conditions:

Please read the short article below before moving on to the next question.

Based on your address, your local water utility is the *[name of utility inserted here]* in Roanoke, VA.

The *[name of utility]* is in charge of providing clean and safe drinking water to the residents of the Roanoke Valley. Their process involves treating water from reservoirs and then delivering the drinking water to your home.



Changes in the environment can cause problems for these reservoirs that lead to algae growing out of control. These changes can also increase metal concentrations. Both increased metal and algal blooms can cause taste, color, and odor changes in the drinking water.

Text specific to general information condition:

Your water utility is using five surface reservoirs and one spring to **store water** until it is ready to be treated. This system uses pipes to **distribute** water to customers' homes. This is intended to allow the water utility to maintain and distribute water throughout their operation.

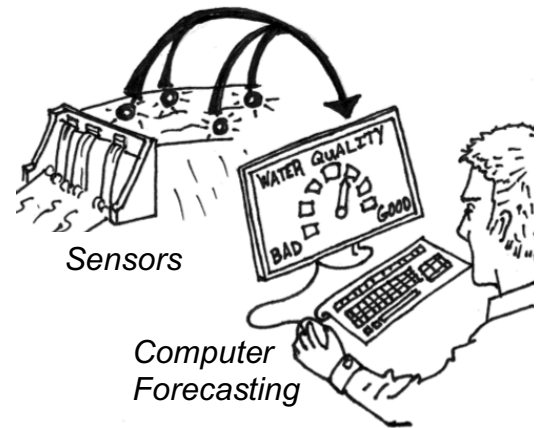
The goal of this system is to help managers **deliver** safe drinking water to your home.



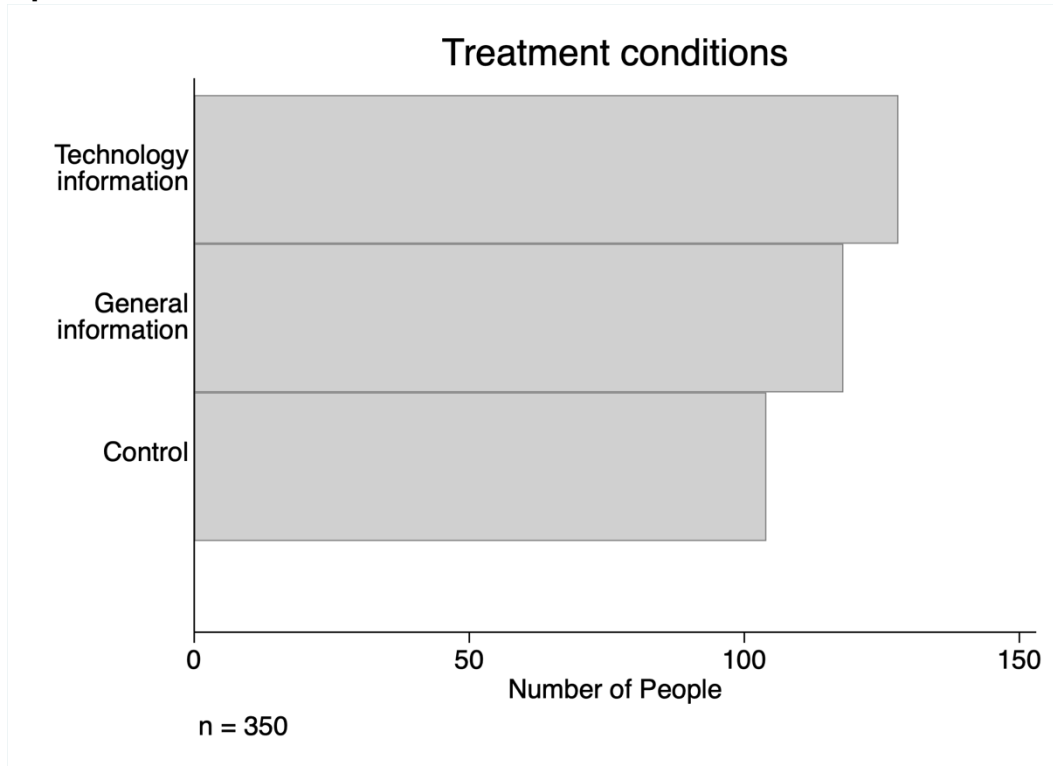
Text specific to the technology information condition:

Your water utility is using **newly developed technology** to help them predict changes in reservoir water. This system uses water quality sensors and **computer forecasting** to alert the water utility when conditions will change in the future. This is intended to allow the water utility to cope with changes early on by adding additional treatments, or by obtaining water from other reservoirs.

The goal of this technology is to help managers detect and respond to changes in reservoirs **more quickly** and deliver safe drinking water to your home.



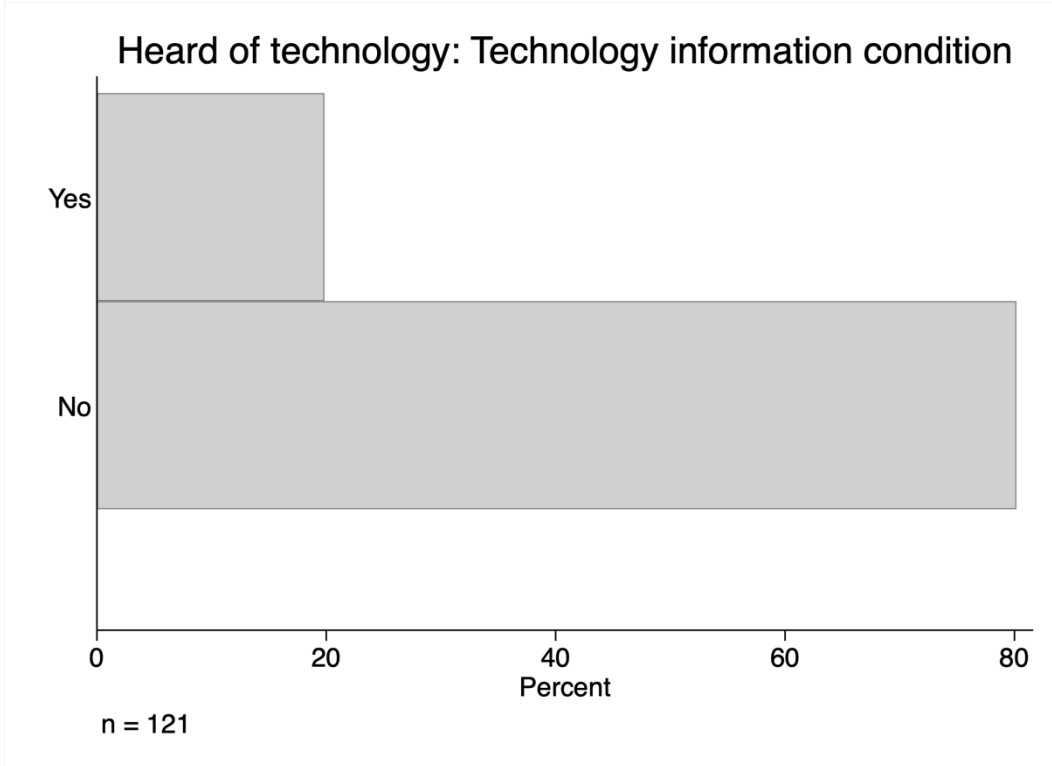
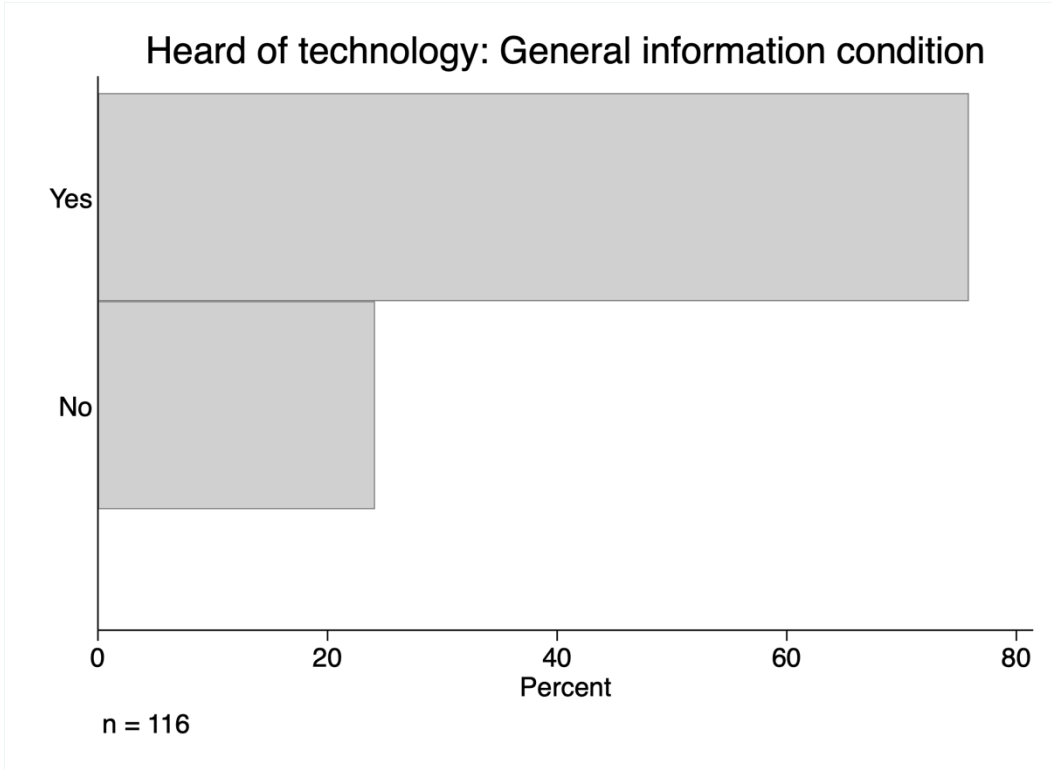
Number of respondents in each condition



14. Have you heard of this technology before?

- Yes
- No

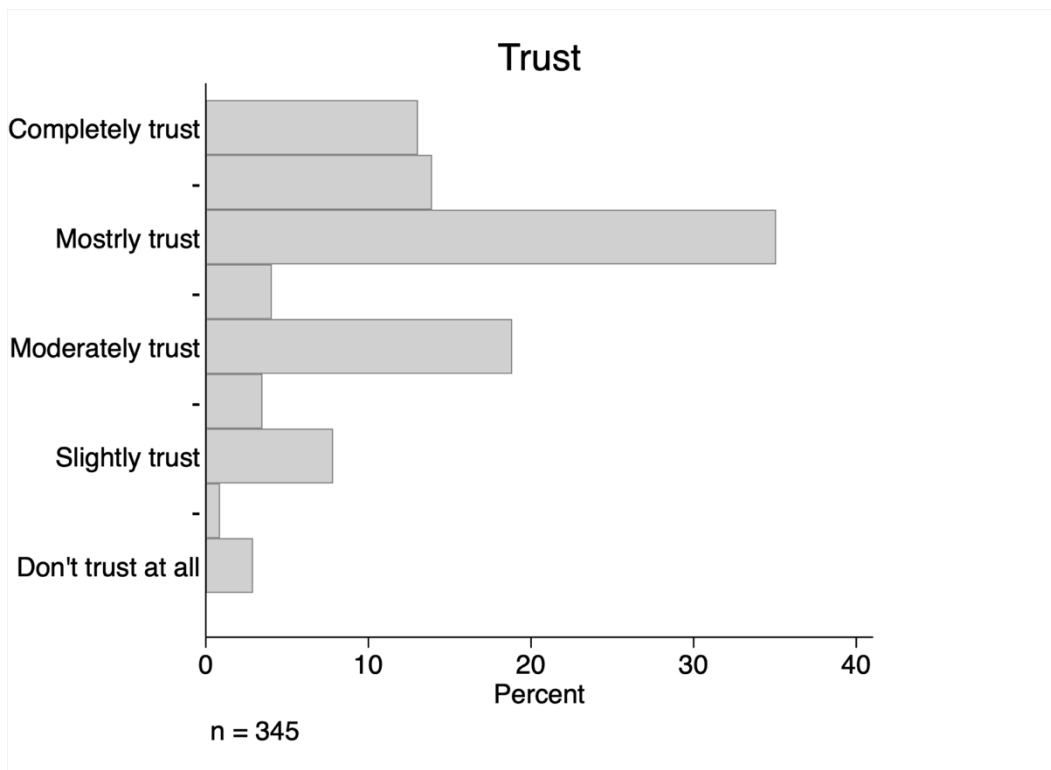
Note: This question followed both *general* and *technology-specific* information conditions and served as an information check.



Note: All respondents answered questions from this point forward

15. To what extent do you *trust* your local water utility to provide drinking water to your home that is safe to drink?

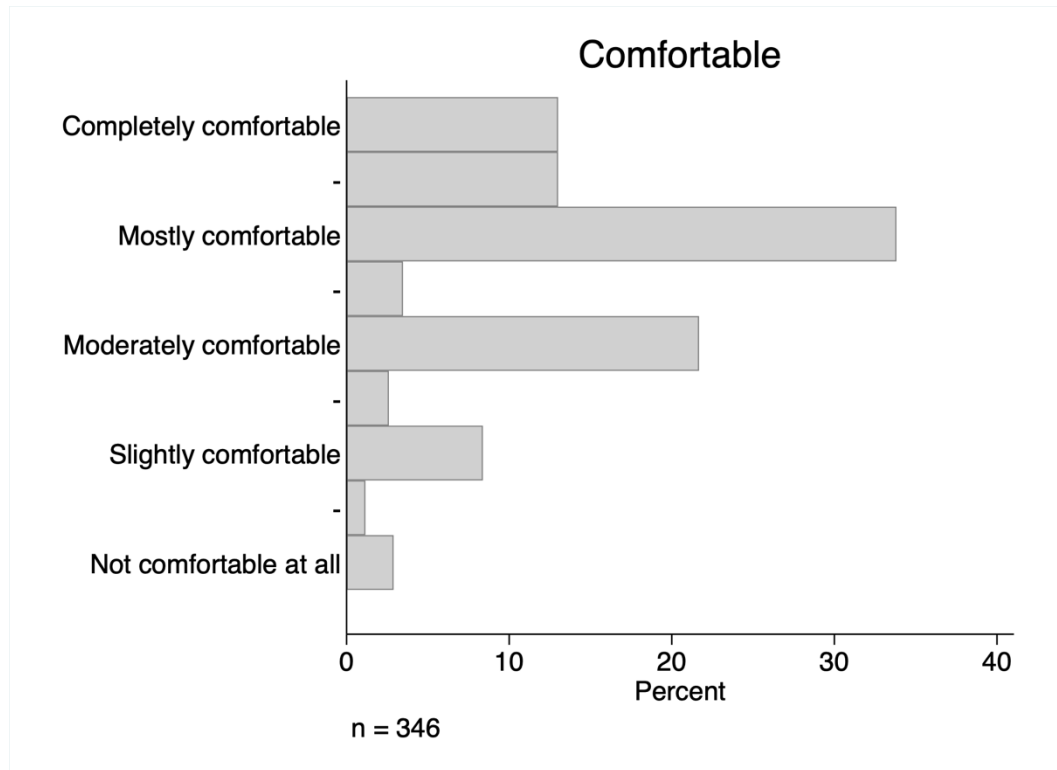
Don't trust at all Slightly trust Moderately trust Mostly trust Completely trust



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Trust	6.3	2.0	7	1	9

16. To what extent are you *comfortable* with your local water utility controlling the quality of water delivered to your home?

Not comfortable at all
 Slightly comfortable
 Moderately comfortable
 Mostly comfortable
 Completely comfortable



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Comfort	6.3	2.0	7	1	9

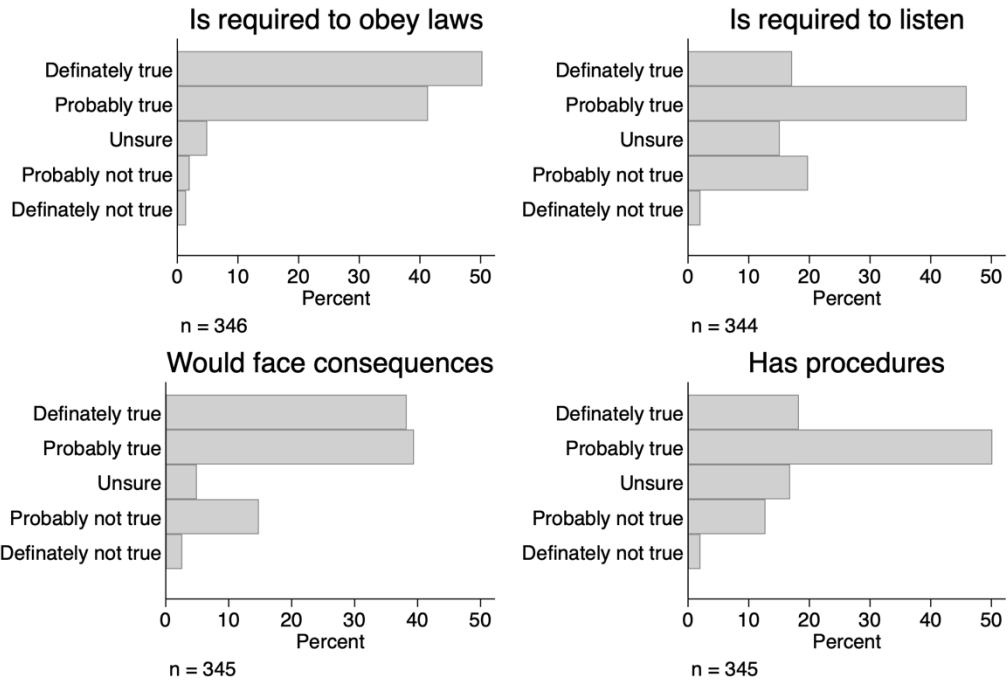
The following questions ask you about your opinions on your water utility, *[insert name of water utility]*. We understand that you might not have strong feelings on all of these statements, but please share your impressions with us to the best of your ability.

17. Please indicate the degree to which you think the following statements about your local water utility are true or not.

My local water utility:	Definitely not true	Probably not true	Probably true	Definitely true	Unsure
is required to obey laws that ensure they distribute safe water.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
is required to listen to public input	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
would face consequences from the government if they failed to distribute safe water.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has procedures in place to resolve any problem I might bring to their attention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

See next page

Procedural determinant beliefs



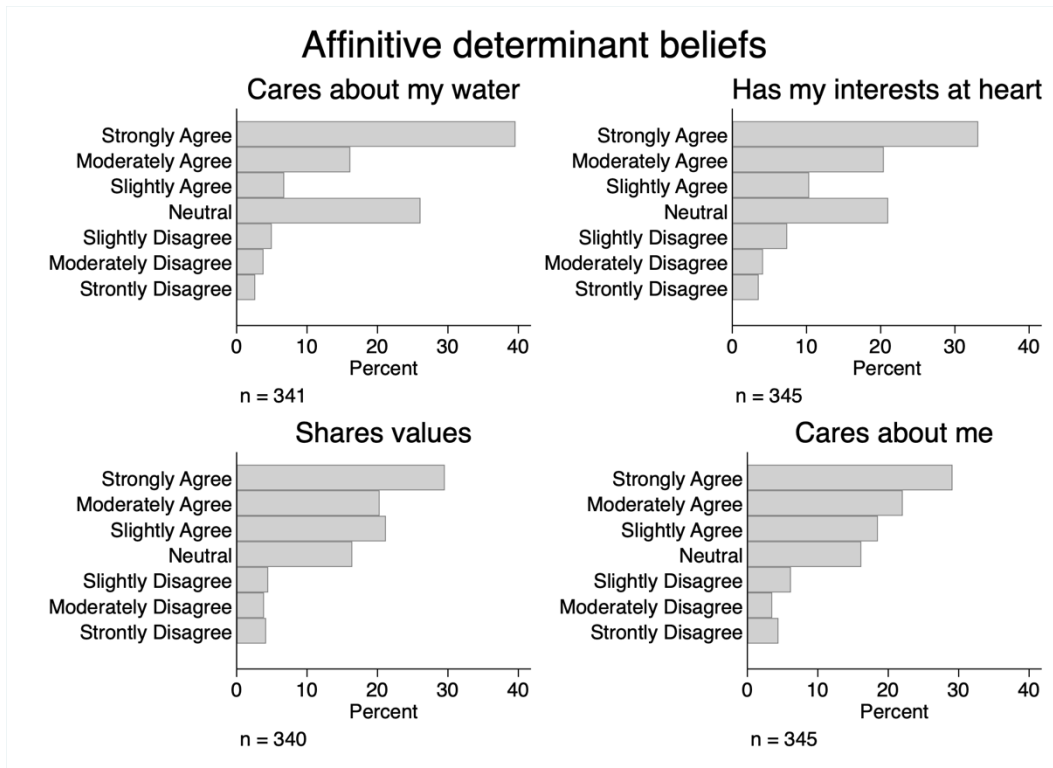
Variable	Mean	St. Dev.	Median	Minimum	Maximum
Is required to obey laws	4.4	0.8	5	1	5
Is required to listen	3.6	1.1	4	1	5
Would face consequences	4	1.1	4	1	5
Has procedures	3.7	1	4	1	5

18. Please indicate the degree to which you agree or disagree with the following statements about your local water utility.

My local water utility:	<i>Strongly Disagree</i>	<i>Moderately Disagree</i>	<i>Slightly Disagree</i>	<i>Slightly Agree</i>	<i>Moderately Agree</i>	<i>Strongly Agree</i>	<i>Neutral</i>
cares about the quality of my drinking water at least as much as I do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
is capable of delivering safe drinking water to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has my best interests at heart ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
shares values similar to mine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has consistently delivered safe drinking water to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
will consistently meet my drinking water expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cares about my well-being.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
is highly skilled at delivering safe drinking water to my home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

See next page

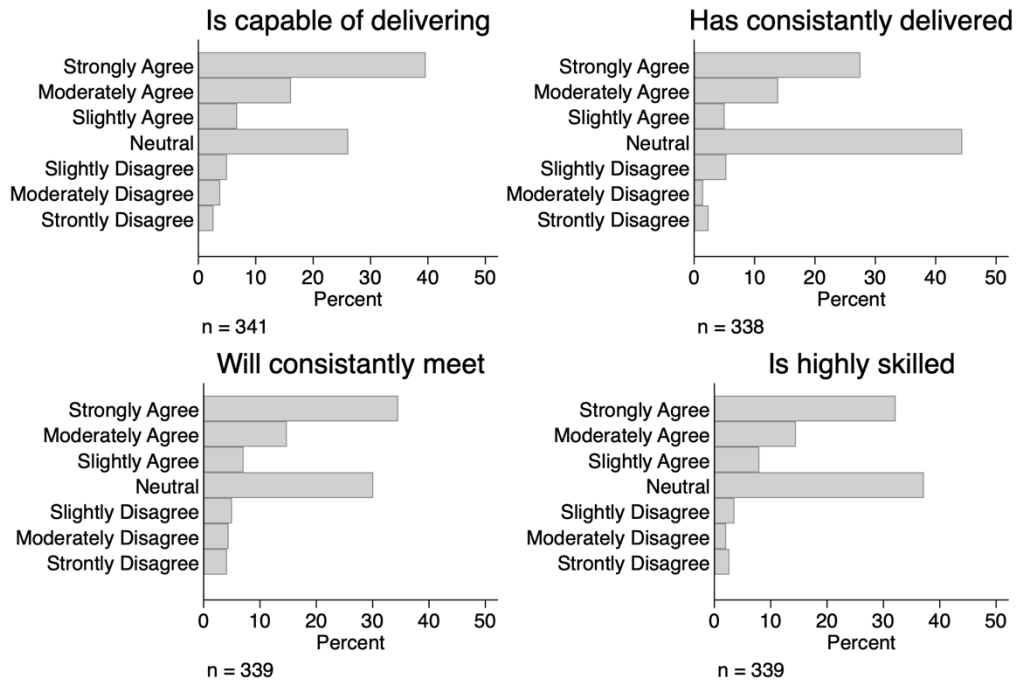
Affinitive determinant beliefs



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Cares about my water	5.4	1.7	6	1	7
Has my interests at heart	5.2	1.7	6	1	7
Shares values	5.3	1.6	5	1	7
Cares about me	5.2	1.7	6	1	7

See next page

Rational determinant beliefs



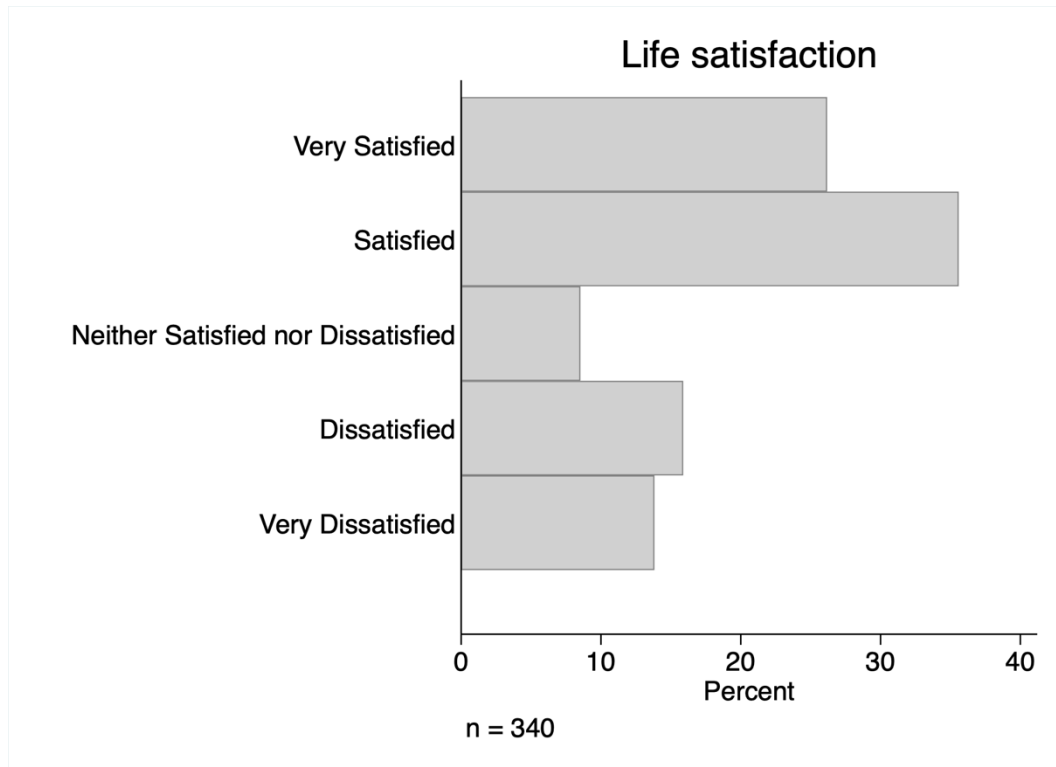
Variable	Mean	St. Dev.	Median	Minimum	Maximum
Is capable of delivering	5.1	1.5	4	1	7
Has constantly delivered	5.0	1.6	4	1	7
Will consistently meet expectations	5.1	1.8	5	1	7
Is highly skilled	5.2	1.6	5	1	7

SECTION D: PLEASE TELL US A LITTLE MORE ABOUT YOURSELF.

In this section, we ask you to reflect on some aspects of your life in general. Your willingness to share this information can help us understand the scope and trends of people's opinions about drinking water throughout the Roanoke Valley.

19. In general, how satisfied are you with your life?

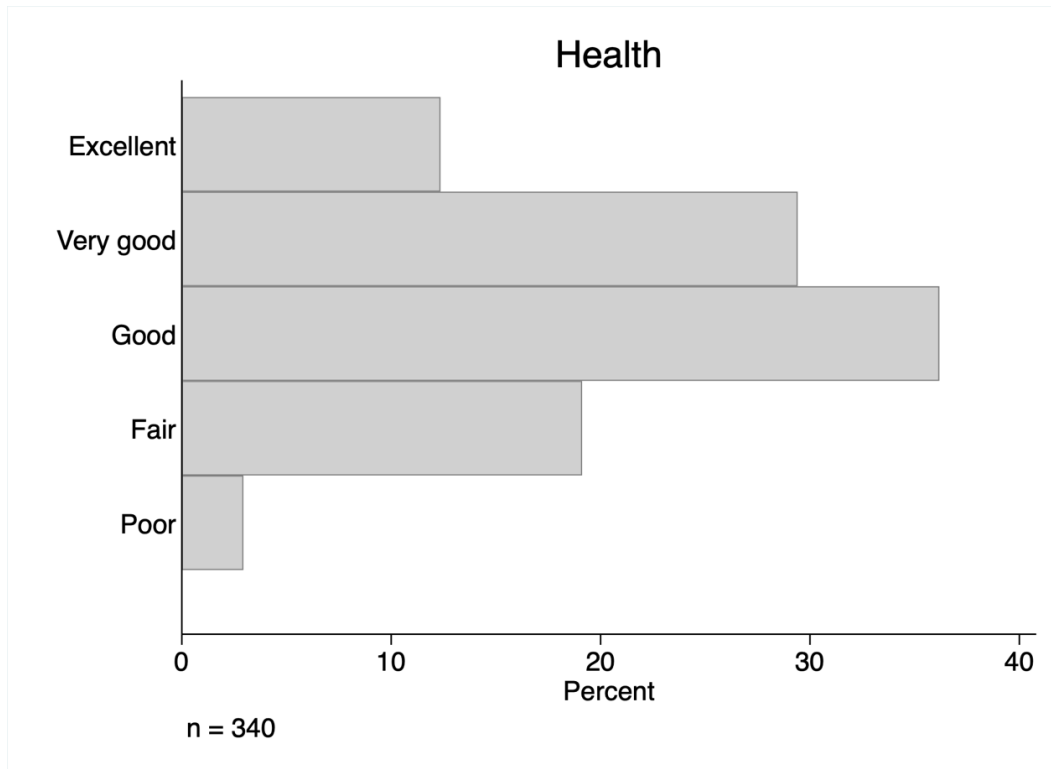
- Very dissatisfied
- Dissatisfied
- Neither satisfied nor dissatisfied
- Satisfied
- Very satisfied



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Life satisfaction	3.4	1.4	4	1	7

20. In general, would you say your health is:

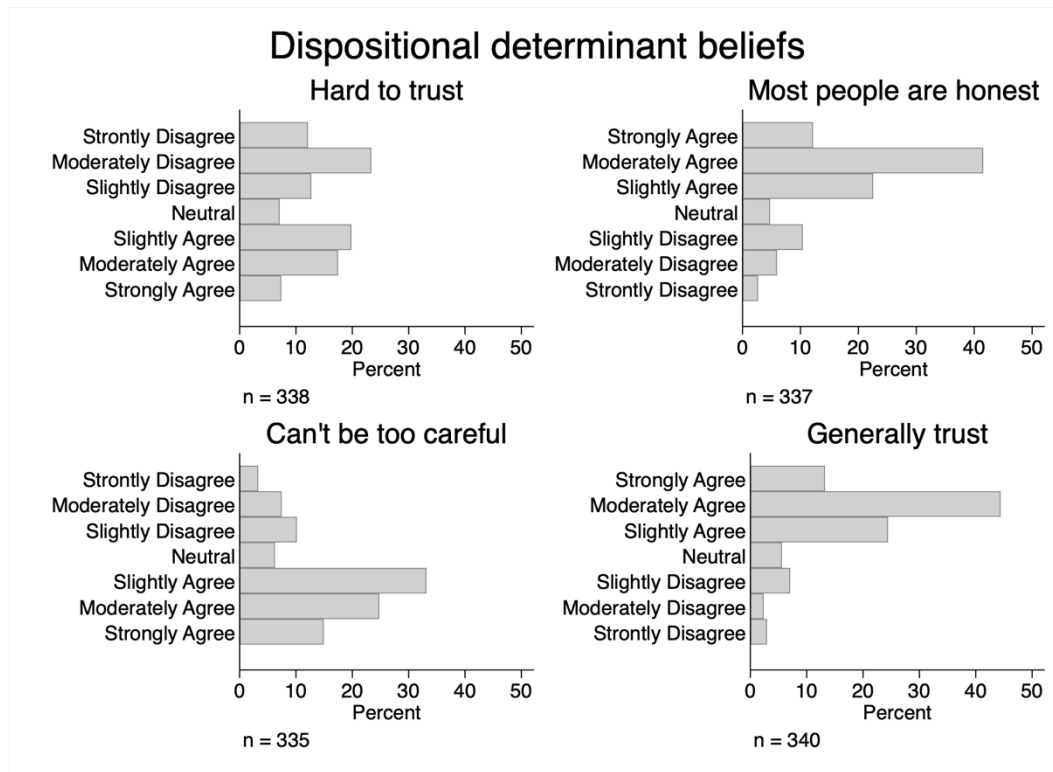
- Poor
- Fair
- Good
- Very good
- Excellent



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Health	3.3	1.0	3	1	7

21. Please indicate the degree to which you agree or disagree with the following statements about people in general:

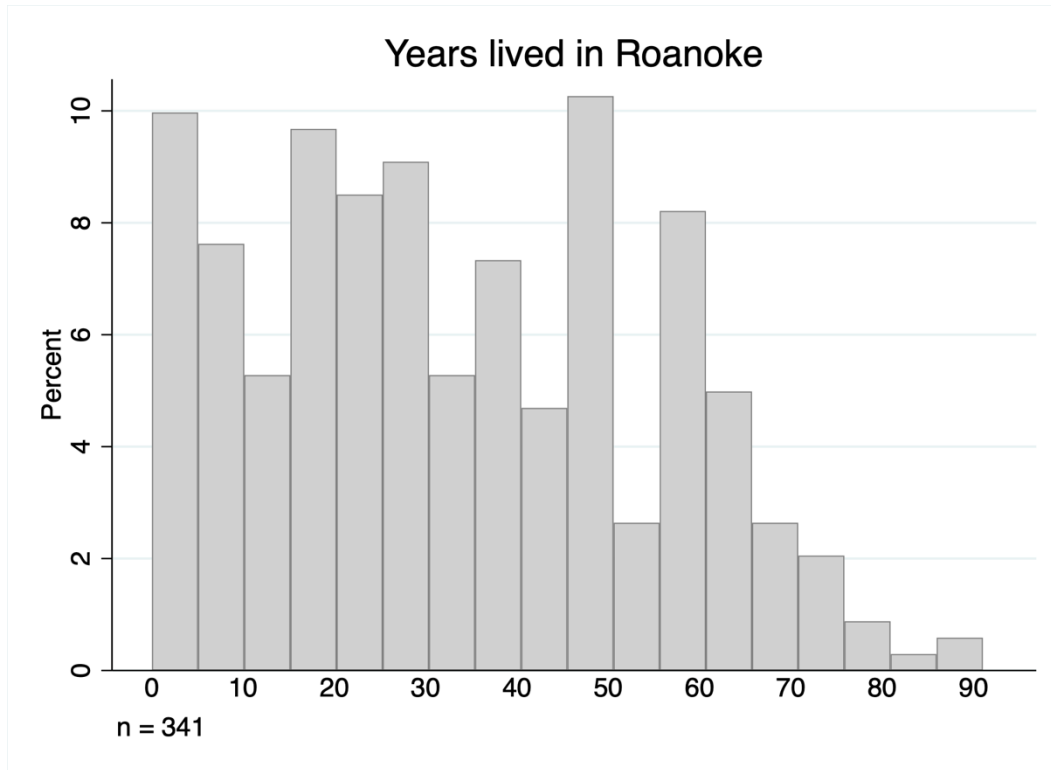
	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree	Neutral
I find it hard to trust others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most people are basically honest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You can't be too careful when dealing with others.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I generally trust others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Hard to trust	4.2	1.9	4	1	7
Most people are honest	5.1	1.5	6	1	7
Can't be too careful	3.1	1.6	3	1	7
Generally trust	5.3	1.4	6	1	7

22. In total, how many years have you lived in the Roanoke Area?

_____ years

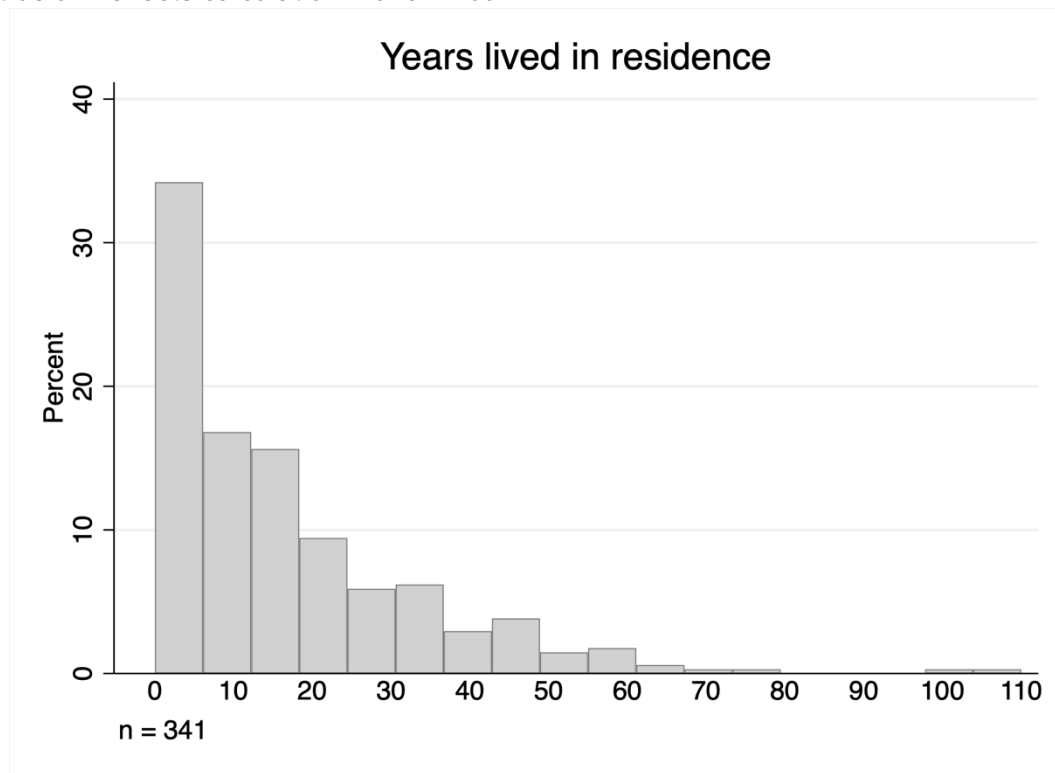


Variable	Mean	St. Dev.	Median	Minimum	Maximum
Years lived in Roanoke	33.8	21.2	30	0	91

23. In what year did you move to your current residence?

Year: _____

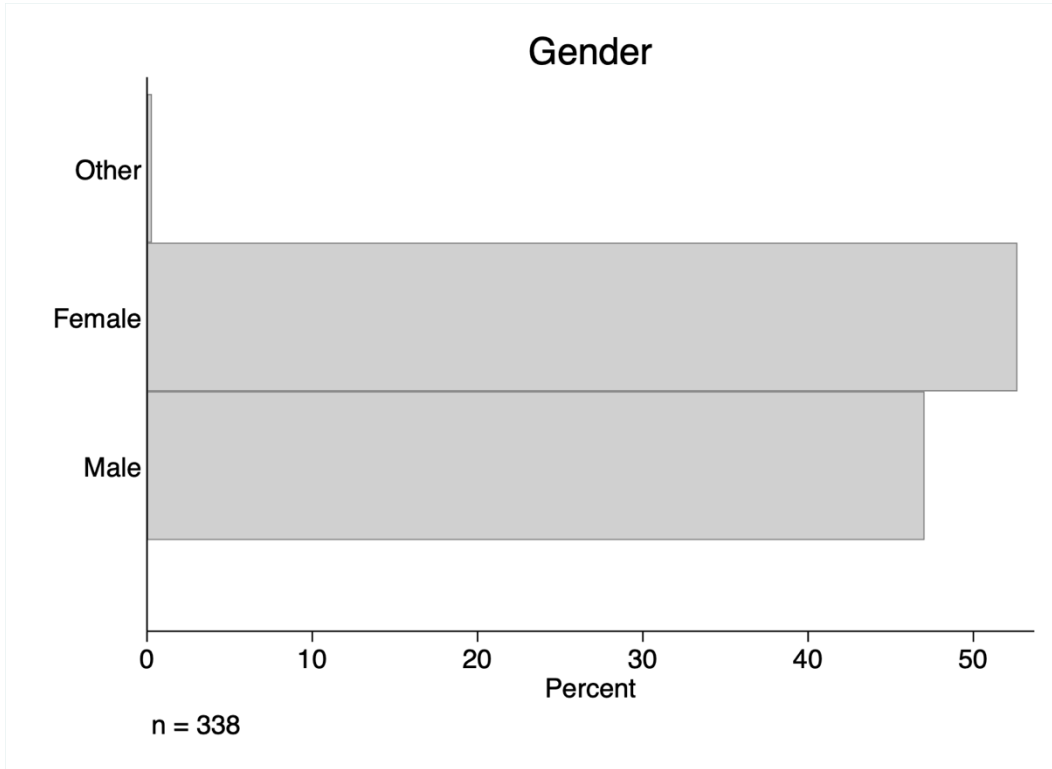
Note: Output below reflects calculation: 2019 - Year



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Years lived in residence	16.8	16.9	12	0	110

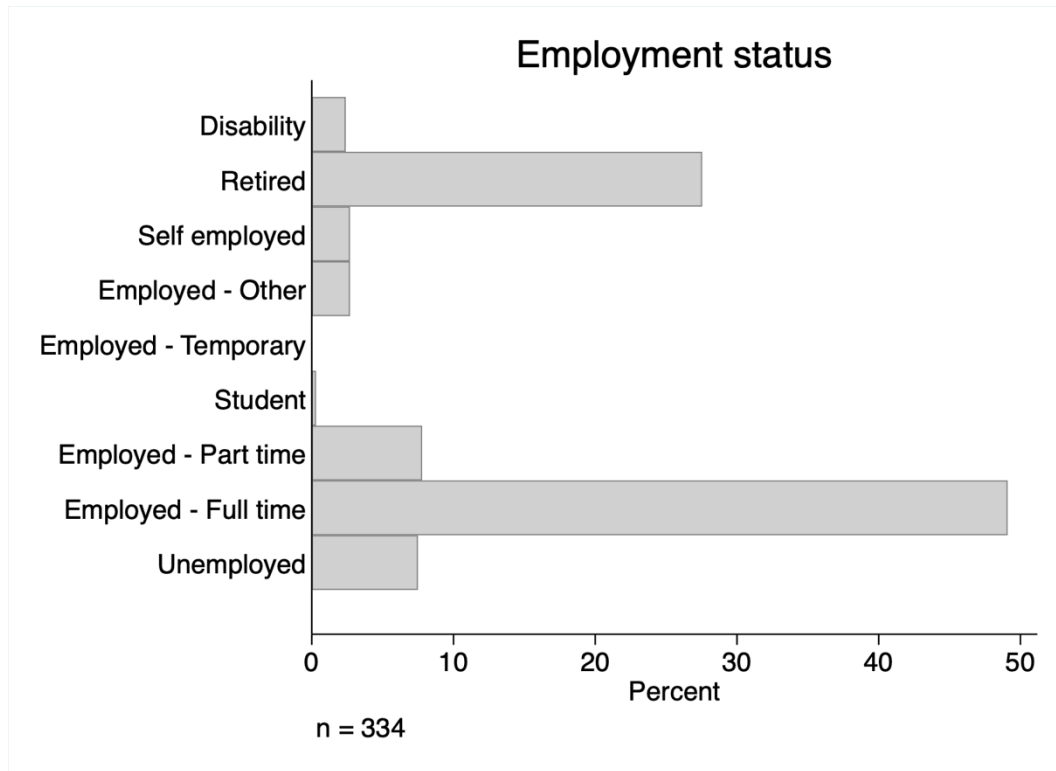
24. Are you:

- Male
- Female
- Other (*please specify*) _____



25. What is your current employment status?

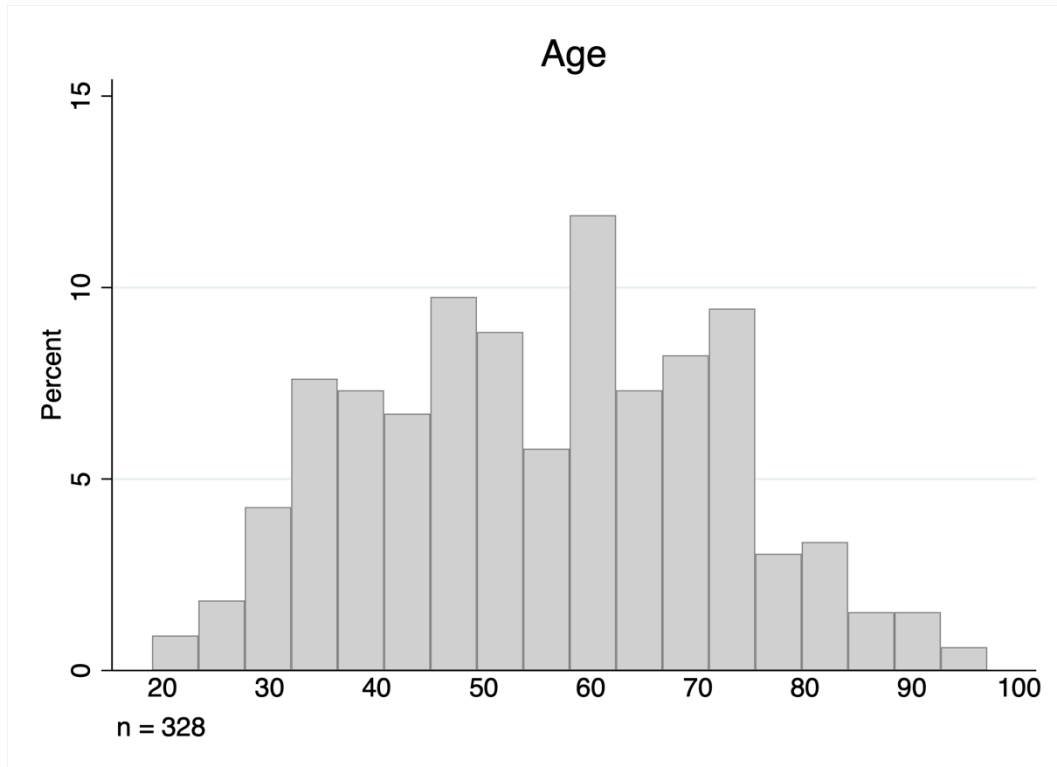
- Unemployed
- Employed – Full Time
- Employed – Part Time
- Student
- Employed – Temporary
- Other (*please specify*) _____



26. What year were you born?

Year: _ _ _ _

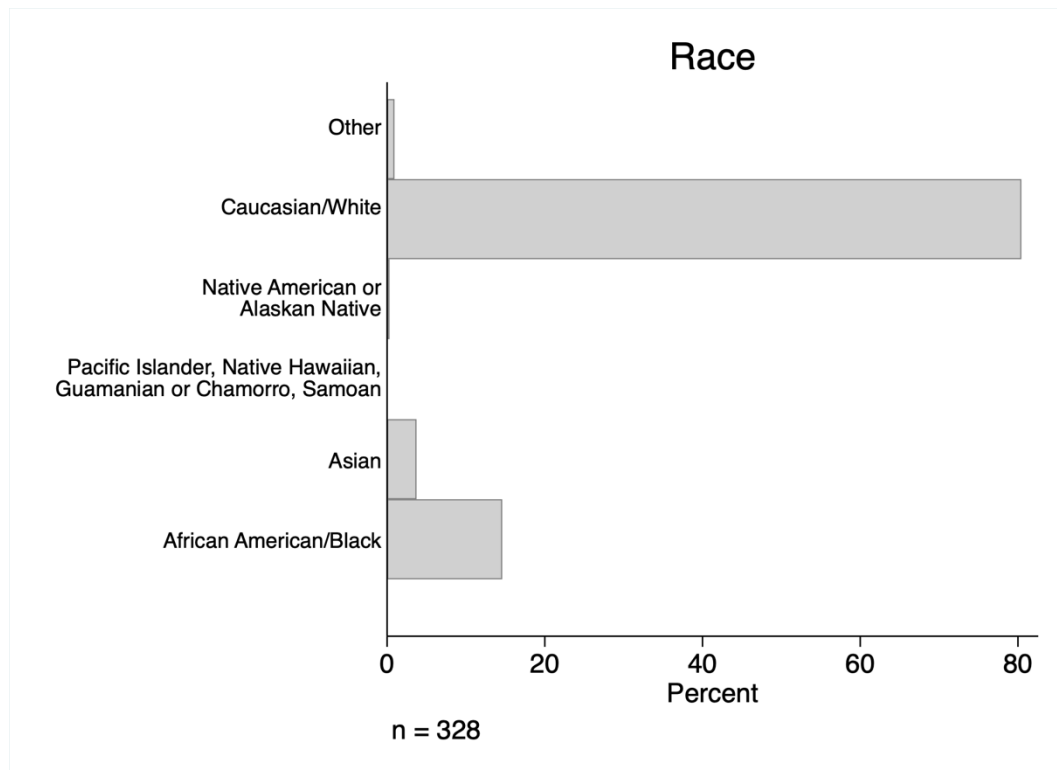
Note: Output below reflects calculation: 2019 - Year



Variable	Mean	St. Dev.	Median	Minimum	Maximum
Age	55.3	16.2	55	19	97

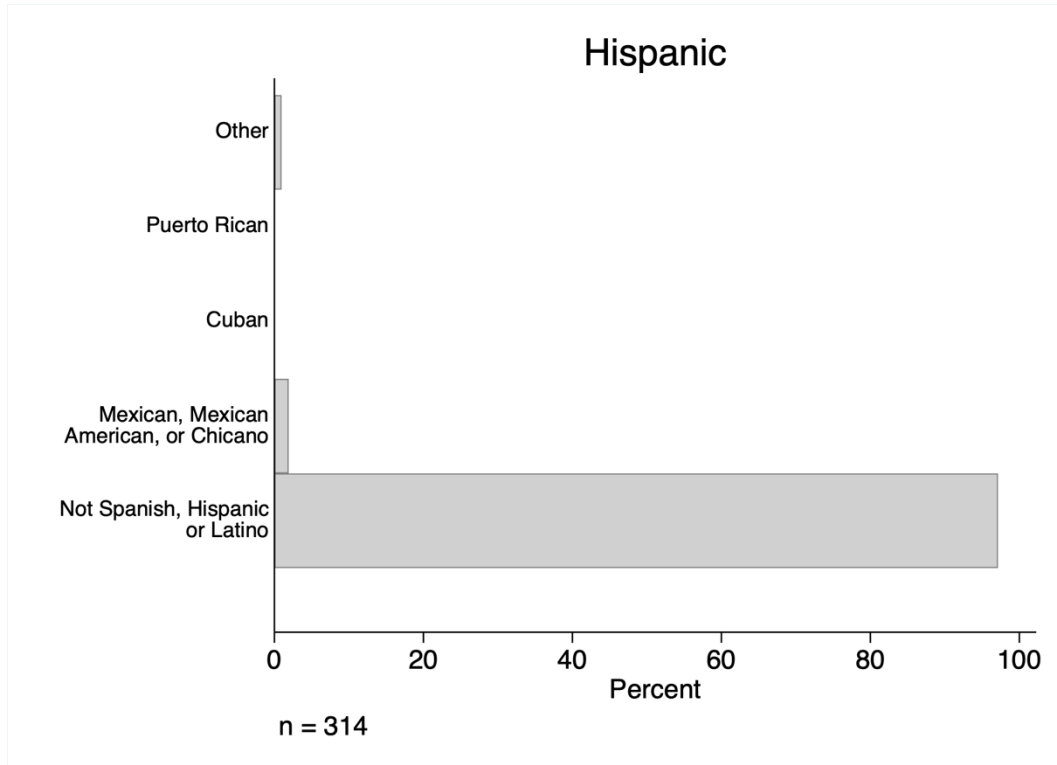
27. What is your race? *Check all that apply.*

- African American/Black
- Asian, including Japanese, Chinese, Vietnamese, Asian Indian, Filipino, Vietnamese, Korean
- Pacific Islander, Native Hawaiian, Guamanian or Chamorro, Samoan
- Native American or Alaskan Native
- Caucasian/White
- Other (*please specify*) _____



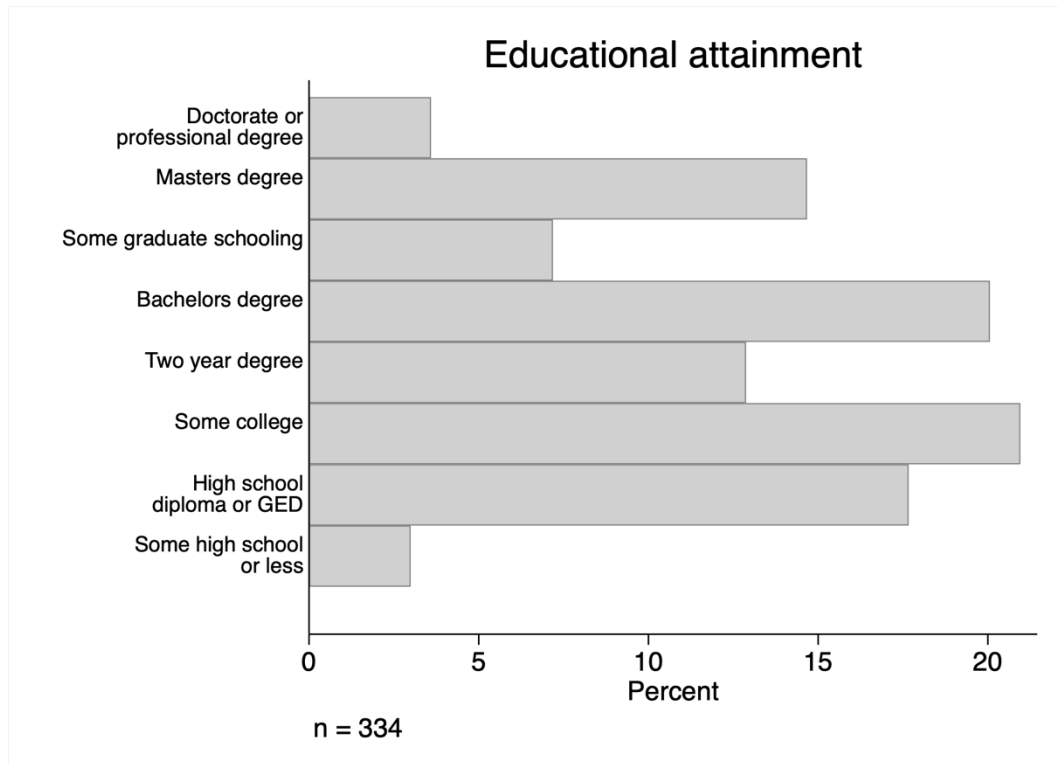
28. Are you of Hispanic, Latino, or Spanish origin?

- No, not Spanish, Hispanic, or Latino
- Yes, Mexican, Mexican American, or Chicano
- Yes, Cuban
- Yes, Puerto Rican
- Yes, other Hispanic, Latino, or Spanish group (*please specify*): _____



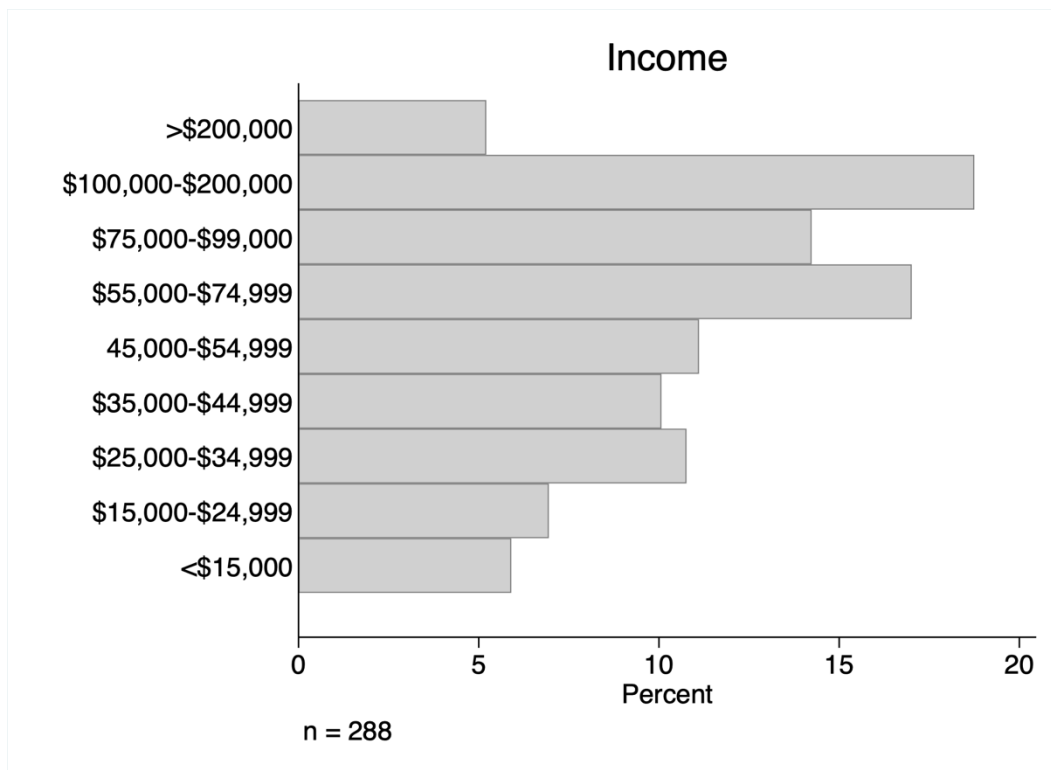
29. What is the highest level of formal education you've completed?

- Some high school or less
- High school diploma or GED
- Some college
- Trade school, Associates, or two year degree
- Bachelors degree
- Some graduate schooling
- Masters degree
- Doctorate degree or Professional degree (Ex: PhD, EdD, MD, DDS, LLB)



30. What was your approximate total income for your household in 2018 (before taxes)?

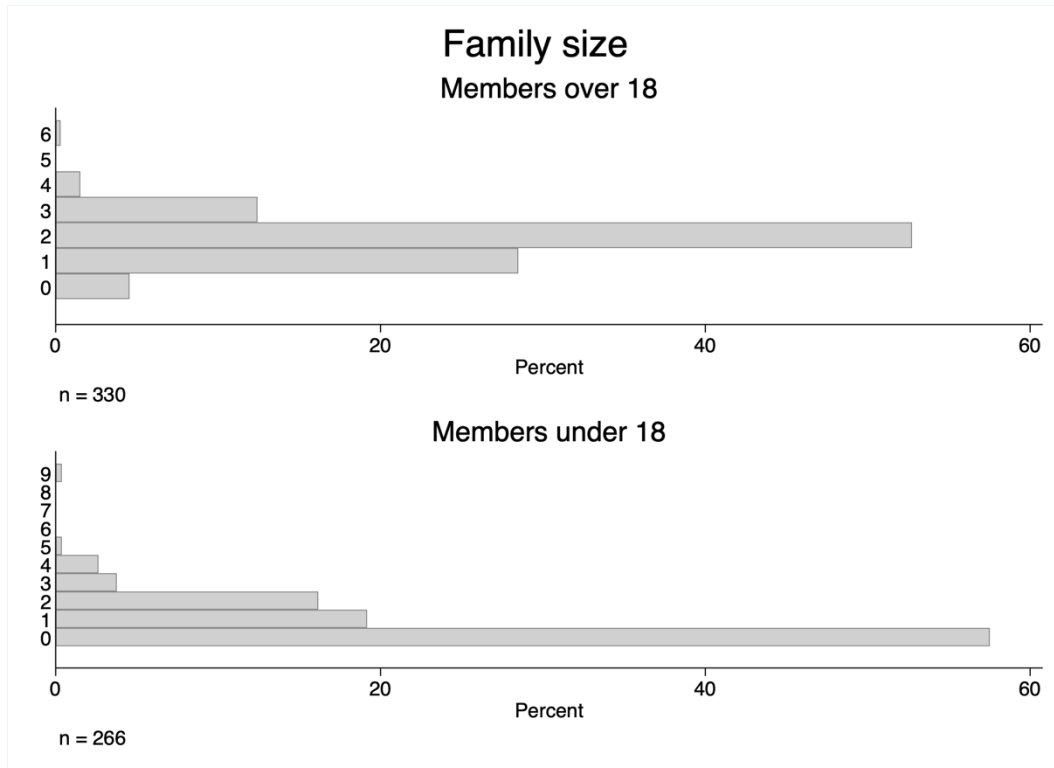
- <\$15,000
- \$15,000 - \$24,999
- \$25,000 - \$34,999
- \$35,000 - \$44,999
- \$45,000 - \$54,999
- \$55,000 - \$74,999
- \$75,000 - \$99,999
- \$100,000 - \$200,000
- > \$200,000



31. Including yourself, what is the size of your family living in your household? Include non-married partners and foster children. Do not include unrelated people (e.g., roommates)

Number of family members in your household over the age of 18 _____

Number of family members in your household under the age of 18 _____



Is there anything else you would like to share with us about your water quality or drinking water habits?

A large, empty rectangular box with a thin black border, intended for the respondent to write their answer to the question above.

We really appreciate the time and effort you have put into helping this study.

Please seal your completed survey in its envelope and hang it in its bag from your doorknob. We'll come back to pick it up in a day or two.

Thank You